Well Construction Details

Top of PVC Casing Elev. **655.27 ft.**

GROUND SURFACE

9-5/8" DIA. BOREHOLE: 0 to 73 ft.

2" DIA. SCHED. 40 PVC CASING: +2 to 140 ft.

BENTONITE-CEMENT SEAL: 0 to 134 ft.

Depth (ft.)	Sample	Recovery (inches)	PID Reading (ppm)
0		51	0
5		0	0
10		12	0
15		36	0
20		51	0
25		60	0
30		42	0
35			

Date 12/8/04
Driller Air Rotary
Drilling Method ARCH
Sampler Continuous Core
Hammer Weight NA **Drop** NA
Logged by _____ **Datum** _____
Surface Elevation 653.41 **Hole Dia.** 9 5/8 in.
Northing 506496.626 **Easting** 1236491.264

Brown Gravelly Lean Clay (CL) (10YR 5/3) Hard, dry to moist, 70% clay, 30% mudstone gravels, some white oxide precipitate

@ 7.5 ft.: Color change to Very Dark Gray (10Y 3/1) from 7 - 7.5 ft. and 8.5 to 9 ft.

Very Dark Gray Clayey Gravel (GC) (10YR 3/1) Dense, moist, 60% olive mudstone gravel, 40% clay/fines

Light Olive Brown Weathered Mudstone (2.5Y 5/3), Moderately consolidated, massive, intensely fractured, low hardness, weak, deeply weathered, iron oxide throughout, primarily along fractures

Fracture orientations vary from horizontal to vertical

@ 28 ft.: Change to Dark Grayish Brown (2.5Y 4/2), abundant fractures with iron oxide

@ 33 ft.: Intensely crushed/fractured to pieces 6.5 in. on edge

BORING_WELL2 CASMALIARIFS.GPJ GEOL.GDT 12/13/10

Well Construction Details and Log of Boring RIPZ-15

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PLATE

E9-26

DRAWN	JOB NUMBER	CHECKED	CHK'D DATE	APPROVED	APPRV'D DATE
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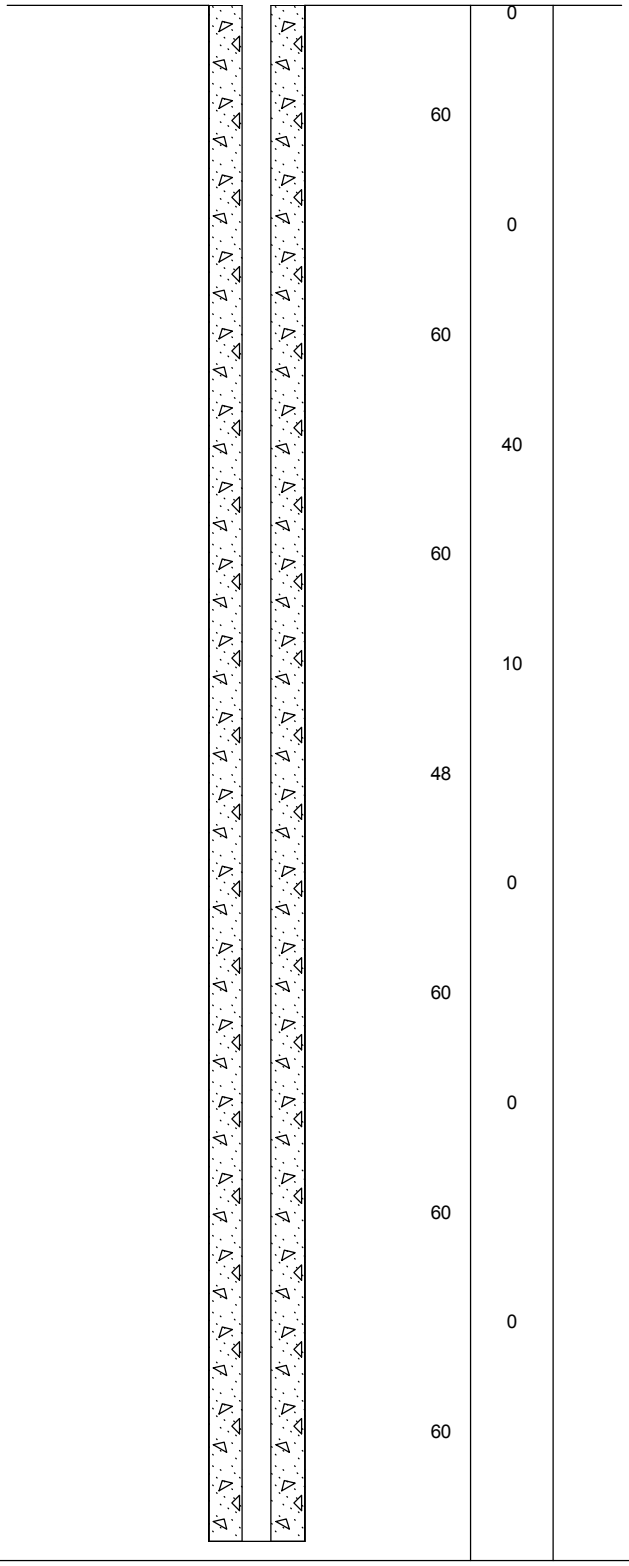

Depth (ft.)	Recovery (inches)	PID Reading (ppm)
35	60	0
40	60	0
45	60	40
50	48	10
55	60	0
60	60	0
65	60	0
70		

@ 36 ft.: Less fractured, vertical fracturing predominates

@ 42 ft.: Fracturing at all orientations with iron oxide

@ 48.3 ft.: Slight sheen

@ 51 ft.: Slight sheen as droplets on outside of core

@ 52 ft.: Gray band from 52 - 53 ft.

@ 57, 58.3, 59, and 59.6 ft.: Gray bands

Dark Gray Unweathered Mudstone (5Y 4/1), Moderately consolidated, massive, occasionally fractured, low hardness, weak, little to no weathering
@ 61 ft.: Small subhorizontal fractures between 61 and 62 ft., white layer at 62.2 ft.

Subvertical fractures at 65.8 and 68 ft.; small subhorizontal fractures between 67.3 and 69 ft.

@ 69.2, 69.4, and 71 ft.: White layers

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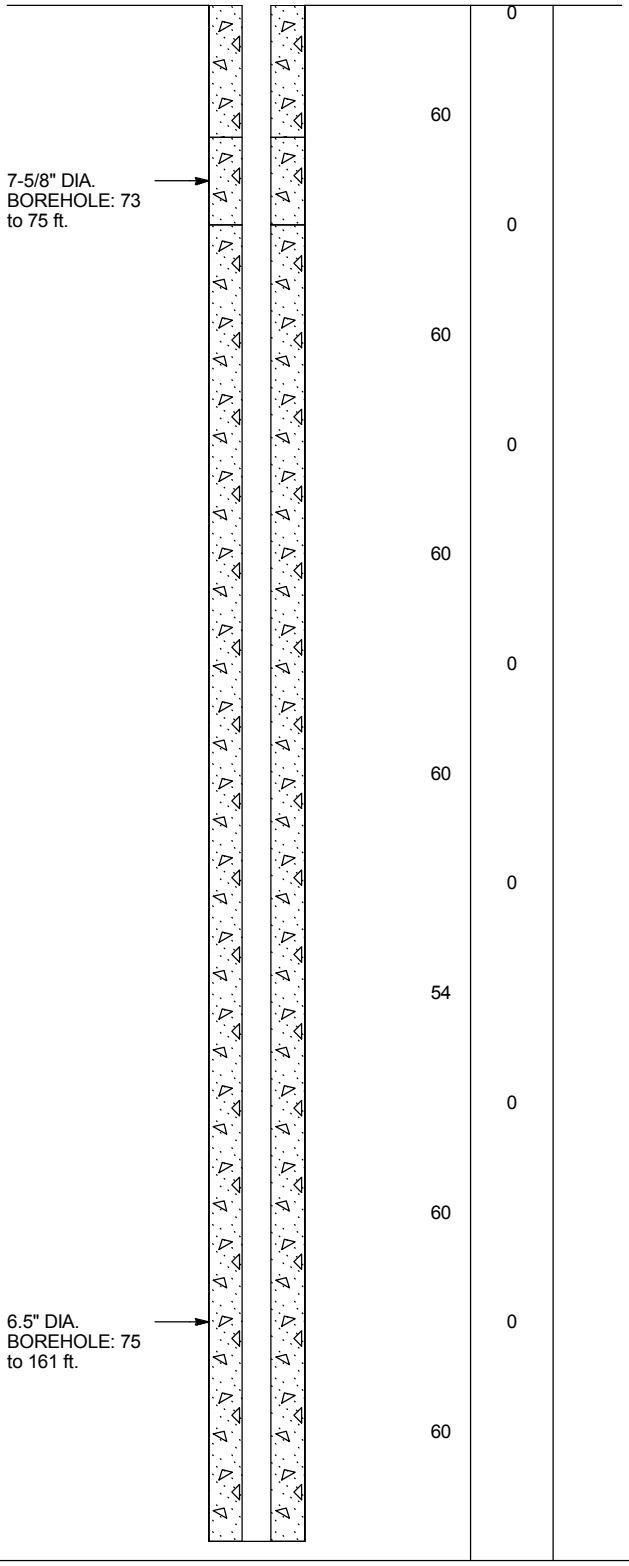

@ 74 ft.: Angled fracture with iron oxide coating

@ 75.8 ft.: White layer and angled fracture

@ 77.8 ft.: Small subangular fractures at 77.7, 79.4, 82.8, 84. 84.2, and 84.5 ft.; subvertical fractures at 85 ft.

@ 86 ft.: Massive, unfractured

@ 90.6 and 90.7 ft.: Small subhorizontal fractures

@ 93.6 ft.: Video survey shows white layer with offset beds and iron oxide coated fracture at 94.5 ft.

@ 94.5 and 95.8 ft.: White layers

@ 96.4 ft.: Fracture with pyrite microcrystals and odor

From 96.9 - 97.8 ft.: Fracture weeping water during video survey

@ 99 and 102 ft.: High angle fractures

@ 102 - 105 ft.: Video survey shows fractured, sheared; white layer at 103.3 ft.

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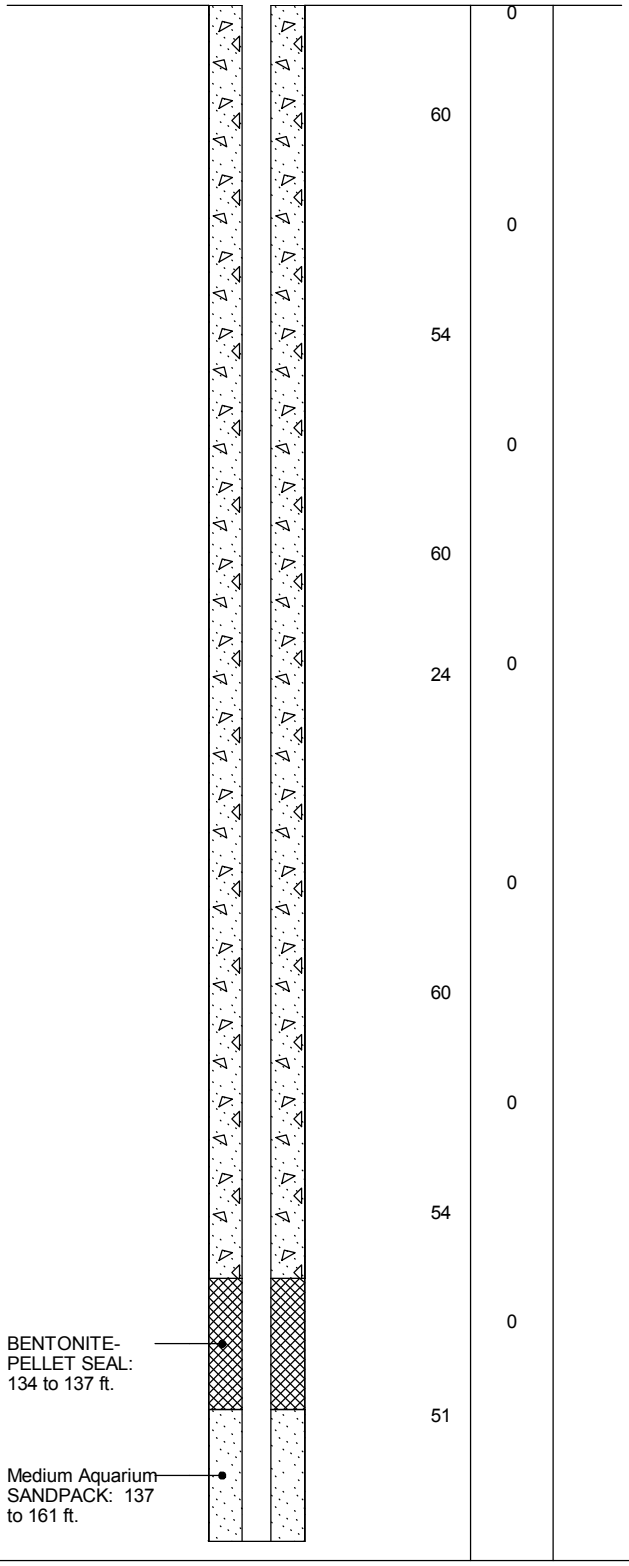

@ 106 ft.: Video survey shows high angle fracture, lighter color

@ 108 ft.: Video survey shows many tiny high angle fractures

@ 109 ft.: High angle fracture

@ 111 ft.: Video survey shows high angle fracture with milky pooling

@ 113.3 - 114 and 114.5 - 115.3 ft.: High angle fractures

@ 118 - 126 ft.: Vertical fractures; no recovery from 120 - 123 ft., but fracture observed in video log; water seen bubbling out of fracture

@ 124 ft.: Massive, unfractured

@ 127 ft.: Video survey shows white layer

@ 131 ft.: Massive, unfractured

@ 137.5 ft.: 2 in. white zone
138.5 ft.: Optical televiewer shows white zone with water running along fracture
@ 139 ft.: Very hard drilling, hard spot, mildly calcareous

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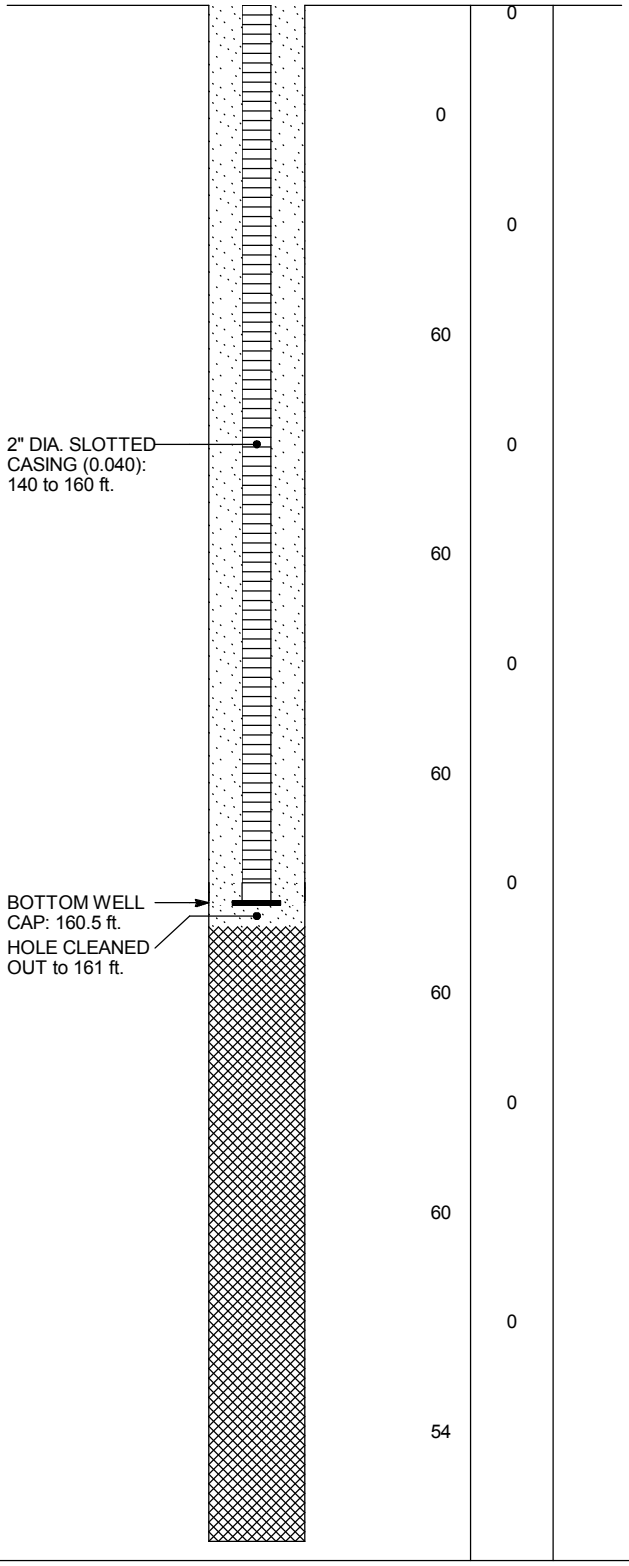

@ 142 - 144 ft.: Video survey shows massive high angle fracture

@ 146.3 - 148.5 ft.: Parallel vertical fractures with white oxide; in video log water seen dripping from fracture

@ 149 ft.: Video survey shows a lot of water running down sidewalls

@ 151 ft.: Video survey shows white layer; vertical fracture from 151.2 - 151.7 ft.
@ 150.8 ft.: White layer; small subhorizontal fractures at 150.8, 153.6, and 153.8

@ 157 - 163.5 ft.: Intensely fractured, no oxides

@ 160.5 - 161.6 ft.: Vertical fractures set at perpendicular orientation

@ 165.5, 165.7, 167.5, 167.7., 167.9, and 169.2 ft.: Small subhorizontal fractures; subangular fractures at 166.7 and vertical fracture at 169.7

@ 170.5 ft.: Video shows formation sheared up with white oxidation; borehole making more water at this zone than fracture zones above

@ 172.5 - 173.5 ft.: High angle fracture

@ 174.6 - 177.5 ft.: Subhorizontal fractures

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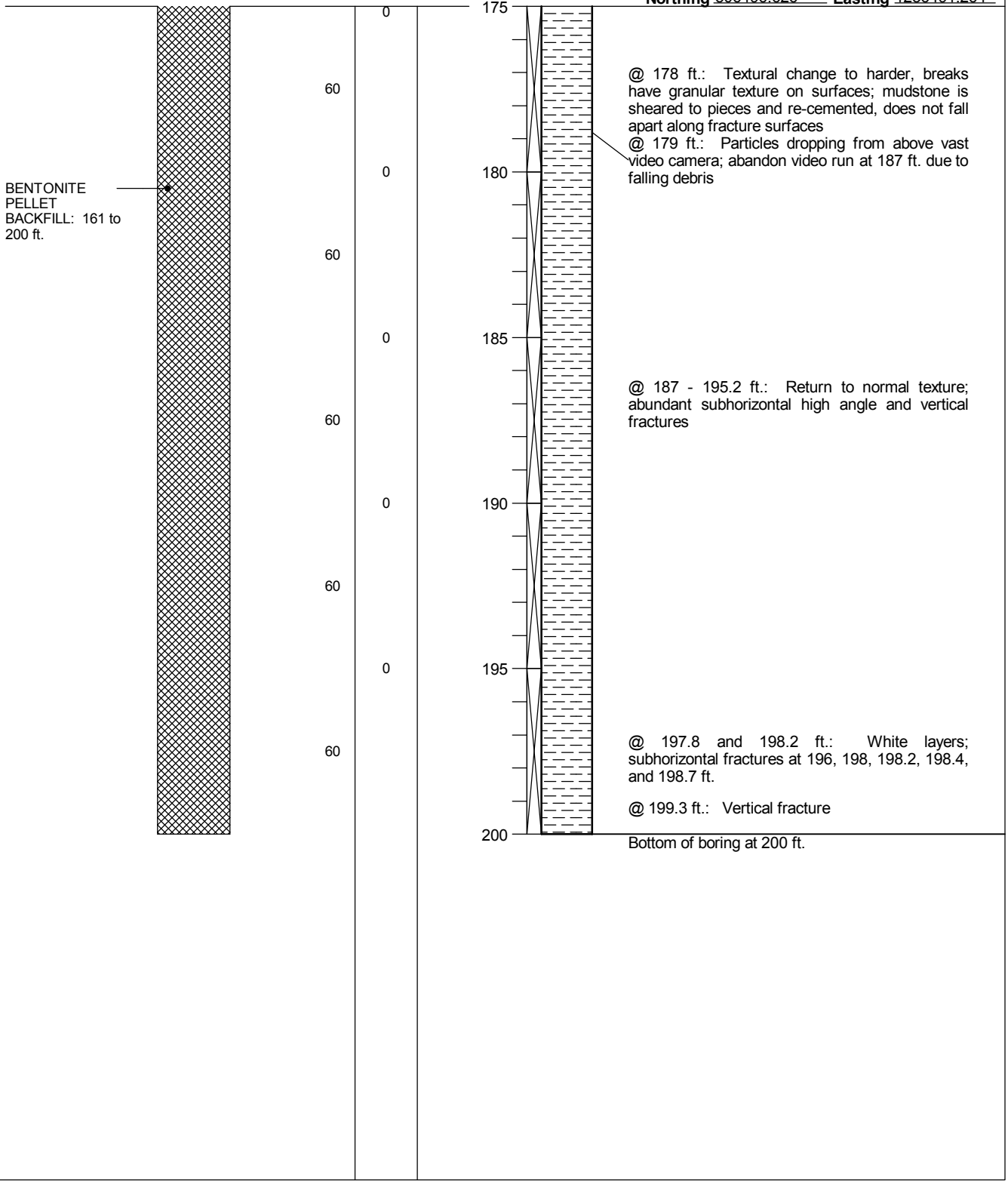

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